

ABSTRACT

Methods relating to the singulation of dice from semiconductor wafers. Trenches or channels are formed in the bottom surface of a semiconductor wafer, corresponding in location to the wafer streets. The trenches may be formed by etching or through an initial laser cut. The wafer is then singulated along the streets with a laser preferably having a beam narrower than the trenches. Multiple, laterally spaced lasers may be used in combination during a single pass to perform simultaneous singulating cuts. Additional edge protection for integrated circuitry on the active surface of the semiconductor dice may be provided by forming trenches or channels along the streets in the active surface instead of the bottom surface, disposing protective material along the streets and within the trenches prior to singulation and cutting through the wafer, leaving protective material on the sidewalls of the channels.

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